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An Enumeration of the Plants Collected by Dr. H. H. Rusby in South America, 1885-1886.—XV.

(Continued from Vol. xvii. p. 284.

Begonia Altoperuviana, A. D.C. loc. cit. 123. ex. descrip. Yungas, 6,000 ft. (684).

Begonia ulmifolia, Humb. in Willd. Sp. Pl. iv. 418. Yungas, 6,000 ft. (690).

Begonia. Unduavi, 8,000 ft. (677).

Begonia scandens, Sw. Prodr. Fl. Ind. Occ. 86. Unduavi, 8,000 ft. (685, 689); Yungas, 6,000 ft. (678).

Begonia parviflora, Pœpp. and Endl. Nov. Gen. i. 7. Yungas, 4,000 ft. (692).

BEGONIA MYRIANTHA, spec. nova. § Wageneria. Ramis, petiolus, foliis subtus et inflorescentia dense fulvo-hispidis. Folia oblique ovata vel orbicularia, cordata, 7-9 loba, majores 25 cm. lata, denticulata 7-9-nervia, supra sparce hispida. Cymis masculis dichotomo-cymosis, multifloris. Flores 6 mm. lati, petalis obovatis, sepalis orbicularis, glabris.
Unduavi, 8,000 ft. (691). Related to *B. hispida*, Schott.

Begonia Clarkei, Hook. f. Ingenio del Oro, 10,000 ft. (680). The same as Mandon's No. 1090. Herb. Kew.

Begonia glandulosa, A. D.C.? Locality uncertain (688).

Begonia. Flowers of *B. parviflora?* Leaves of a plant of some different genus. Near La Paz, 10,000 ft. (687).

CACTEÆ.

Cereus, sp. Near La Paz, 10,000 ft. (2040).

Cereus, sp. Near La Paz, 10,000 ft. (2043).

HARIOTA CRENATA, sp. nov. § Alatæ. Caule ramisque folia-

ceo-dilatatis, lævibus, nervo medio valido, ad margines crenatis. Ramis undique sub-15-crenatis, 20-30 cm. longis, 3–6 cm. latis. Nervo medio striato. Flores parvi, laterales, sessiles. Bacca (immatura ?) 7mm. diametro. Setæ 2-5,2 mm. longæ. Calycis tubus exsertus.

Nearest *Rhipsalis platycarpa*. The generic name *Hariota* antedates *Rhipsalis*. Yungas, 6,000 ft. (2047).

Hariota? Yungas, 6,000 ft. (2048).

Opuntia, sp. Guanai, 2,000 ft. (2044).

Mamillaria? Yungas, 6,000 ft. (2045).

FICOIDEÆ.

Mollugo verticillata, L. Sp. Pl. 89. Falls of Madeira, Brazil (1159). Collected also at Sorata, 10,000 ft.

Mollugo Glinus, A. Rich. Fl. Abyss. i. 48. (*M. glinoides*, Camb.) Falls of Madeira, Brazil (1503).

UMBELLIFERÆ.

Hydrocotyle Bonplandi, Rich. Hydroc. No. 27, f, 7. Unduavi, 12,000 ft. (1358); Sorata, 13,000 ft. (1778). The same as Holton's No. 637 from New Grenada.

Hydrocotyle quinqueloba, R. & P. Fl. Per. iii. 25, t. 248. f. b. Yungas, 6,000 ft. (1759).

Hydrocotyle Bonariensis, Lam. Encycl. iii. 147. Tacna, Chili (1760).

Hydrocotyle ranunculoides, L. f. Suppl. 177. Near Valparaiso, Chili (1110).

HYDROCOTYLE? ECCENTRICA, sp. nov. Caulis repens ad nodos radicans; foliis eccentrico-peltatis, longe et gracile petiolatis utriusque glabris, ovatis, tenuis, 6-8 cm. longis, apice longe accuminatus, margine serrulatis, 5-7 lobatis; pedunculis petiolis æqualis; capitulis multifloris; pedicellis 2mm. longis. Fructus non visus.

Yungas, 6,00 ft. (1761). A curious member of the group, perhaps representing a distinct genus.

Azorella biloba, Wedd. Chlor. And. ii. 195. Sorata, 10,000 ft. (1952).

Spananthe paniculata, Jacq. Coll. iii. 247. Yungas, 4,000 ft. (873).

Bowlesia lobata, R. & P. Fl. Per. iii. t. 251. f. b. Unduavi, 8,000 ft. (1958); Ingenio del Oro, 10,000 ft. (1234).

Bowlesia palmata, R. & P. loc. cit. f. a. Near La Paz, 10,000 ft. (1355).

Asteriscium Chilense, C. & S. Linnæa, i. 354. Near Valparaiso, Chili (1930).

Eryngium paniculatum, Laroch. Eryng. 59, t. 26. Yungas, 6,000 ft. (576); Unduavi, 8,000 ft. (578); near Valparaiso, Chili (607).

Eryngium elegans, C. & S. loc. cit. 348? Reis, 1,500 ft. (577).

Eryngium fœtidum, L. Sp Pl. 336. Mapiri. 5,000 ft. (905).

ARRACACIA ANDINA, sp. nov. Erectus, 30-40 cm. altus; foliis 1-2-pinnatis, 10-15 cm. longis; segmenta 5-7, late ovata, utriinque glabra, acuminata, petiolulata vel sessilia, lobata vel divisa, serrulata; involucro o; pedunculæ numeroses, 2-3 cm. longæ; umbellulæ multiflores, pedicellis 2mm. longis; fructus ovoideus, 4mm. longus. Related to *A. esculenta*.

Ingenio del Oro, 10,000 ft. (1776). The same as Mandon's 590 and 595.

Apium leptophyllum (Pers.) F. Muell. in Benth. Fl. Austral. iii. 372. Near La Paz, 10,000 ft. (1768).

Oreosciadium dissectum (Benth.) Wedd. Chlor. And. ii. 204. Unduavi, 10,000 ft. (1767).

Oreomyrrhis andicola (Lag.) Hook f. Fl. Antarc. Unduavi 8,000 ft. (1769); near La Paz, 10,000 ft. (1770).

Fœniculum vulgare, Gærtn. Tacna, Chili (1777).

Daucus montanus, Willd. in Schult. Syst. vi. 482. Near La Paz, 10,000 ft. (1763).

ARALIACEÆ.

Sciadophyllum pentandrum (R. & P.) Poir. in Lam. Encycl. vi. 747. Yungas, 6,000 ft. (609).

SCIADOPHYLLUM PANICULATUM sp. nov. Caule arboreo? Foliis 8-9-digitatis, crasse petiolatis folioles longe petiolulatis ovalis vel ellipticis, apice acuminatis, basi rotundis, margine integris, supra glabris, subtus velutinis, 12-15 cm. longis, 6-7 cm. latis inflorascentia paniculata; floribus capitatis, capitulis 8-10 mm. diametro. Apparently nearest *S. angulatum*.

Mapiri, 5,000 ft. (608).

Dendropanax arboreum, Dec. & Pl. Guanai, 2,000 ft. (2691).

OREOPANAX RUSBYI, sp. nov. Arbor? Folia simplicia, coriacea, petiolata, ovato-lanceolata, serrulata, trinervia, 10-15 cm. longa, 5-7 cm. lata, supra glabra, subter pallida, reticulata velutina; capitula breve et crasse pedunculata, 2 cm. diametro (fruct); flores sessiles; bacca 6-7 mm. diametro.
Yungas, 6,000 ft. (2654).

CAPRIFOLIACEÆ

Sambucus Peruviana, H.B.K. Nov. Gen. iii, 429. Unduavi, 8,000 ft (727). The same as Mandon's No. 325, Herb. Kew.

Viburnum glabratum, H.B.K. loc. cit. 428. Mapiri, 5,000 ft. (2469). Yungas, 4,000 ft. (2584).

Viburnum Ayavacense, H.B.K. loc. cit. Guanai, 2,000 ft. (2560).

Viburnum tinoides, L. f. Suppl. 184. Unduavi, 10,000 ft. (725).

Viburnum lasiophyllum, Benth. Plant. Hartweg, 189. Sorata, 10,000 ft. (726).

RUBIACEÆ.

Ourouparia Guianensis, Aubl. Plant. Guian. i. 177. Guanai, 2,000 ft. (2104).

Cinchona condaminea, Humb. & Bonpl. Pl. Æquin. i. 33. Yungas, 6,000 ft. (2347).

Cinchona succirubra, Pav. Yungas, 4,000 ft. (2348).

Other species of *Cinchona* were collected but were not included in the general distribution.

Cascarilla, sp. Junction of the Rivers Beni and Madre de Dios (2867).

Manettia ignita (Vell.) Schum. in Mart. Fl. Bras. vi. Pars. vi. (2) 171. Mapiri, 5,000 ft. (1126).

Manettia luteo-rubra, Benth. Linnæa, xxiii. 445. Yungas, 6,000 ft. (2159).

Manettia splendens, Gardn. in Herb. Kew. Guanai, 2,000 ft. (1127). Name not in Schumann's Rubiaceæ of the Brazil Flora.

Manettia Lygustum, Sw. Prodr. Fl. Ind. Occ. 37? (*M. coccinea*, Willd.). Junction of the Rivers Beni and Madre de Dios (2478). The same as Spruce's No. 3874, Herb. Kew.

Mantitia, sp. Collected only in fruit. Probably undescribed. Mapiri, 2,500 ft. (2158).

The Flora of the Desert of Atacama.

By Thos. Morong.

Under the old geographical limits, before Chile had appropriated as a war indemnity the whole of Bolivia's seacoast and three degrees of Peruvian soil, the desert of Atacama was figured as extending from Coquimbo on the south to Bolivia on the north and eastward from the Pacific Ocean to the Andes, being nearly coincident with the province of the same name in Chile. So far, however, as the natural features are concerned, the name might well be applied to the entire region lying between Valparaiso and Ecquador, for it is all a desert broken only by lofty mountain peaks and deep valleys, the beds of ancient rivers, and watered here and there by scanty streams derived from the melting of the snows upon the high Cordilleras. The water from this source is carefully husbanded by the inhabitants of the valleys, and used in irrigation for agricultural purposes. Very little of it goes to produce the flora referred to in this article, by far the greater part of which belongs exclusively to the desert proper.

It seems like a contradiction in terms to speak of a *desert* vegetation, and especially one upon a territory so bleak and desolate as the Atacama, which is distinguished by the number of its hideously barren hills of rock and its sandy wastes. And yet this desert bears a flora quite extensive in the number of its species and very peculiar and interesting in its character. Over 500 species of plants have been gathered within its borders, and probably as many more might be detected upon a close research. One naturally wonders by what chance such a flora can be brought into existence and how it can live after being once started. In explanation it must be said that this region is not absolutely rainless, although it is nearly so. There is an occasional winter rain, or rarely two or three showers in the course of a winter, occurring at long intervals. Generally such rains are barely enough to moisten the ground, but that little is sufficient to cause the seeds, which are lying dormant in the sand or the bulbs beneath the ground, to germinate. Once up the seedling is kept alive by the dews which fall nightly upon the earth, and by the

mists that hang around the hills every morning in the winter and spring-time. In this way these growths obtain moisture enough to enable them to reach maturity. Besides this the Atacaman plants have acquired several peculiarities which admirably adapt them to their conditions of life. One of these lies in the power of the seeds to live for many years in the dry sand without germinating. They have been known to retain their vitality for ten years and then to sprout at the touch of rain.

I suspected from appearances that a special weather protection existed in many or all of these seeds, and Dr. Gregory of Barnard College, who has, at my request, kindly examined microscopic sections of a number of species, confirms my suspicions so far as these particular species are concerned. The seeds in every case proved to have unusually thick walls and a copious supply of albumen around the embryo. In one instance (*Pintoa*) she reports that the "seed coats are heavy, the outer one having peculiar shaped cells which turn to mucilage on coming into contact with water." Another (a *Tristagma*) has "copious albumen and the outer walls are thickened and turned in color to a dark brown, making an extremely hard coat." *Calandrinia* seeds presented a coating "somewhat heavy, but with a peculiar readiness to break on contact with water." *Cristaria* has an integument of several layers which together make a thick wall, and the interior albuminous. *Viola* shows in the seed coat a contrivance similar to that of *Pintoa*, with more or less of albumen in the interior.

While seeds are thus fortified against a protracted drought, tubers and bulbs are equally well equipped by the large amount of water or milk which they store up. I found many of the bulbs that I collected so full of juice that I could squeeze it out in a stream by hand.

Another peculiarity of the herbaceous flora, evidently acquired, is the early age at which the plants begin to flower and fructify. As if aware that they have only an ephemeral life and that what they have to do must be done quickly, they are scarcely above ground before they put forth blossoms. Many species may be seen in flower when hardly an inch in height, and which go on flowering until they reach the stature of two or three feet—if they can survive so long. I was continually deceived by this

habit, naturally supposing that these wee things must be different in species from plants that I had seen elsewhere only as tall and robust when in flower. A little more experience, however, convinced me that these Liliputians were merely taking time by the forelock.

Still another adaptation, excited apparently by the conditions under which they exist, is the extraordinary number of seeds formed by many plants and scattered over the soil in which they grow. This habit is not confined to species which usually yield great numbers of seeds, but seems common to all the desert flora. Thus a little violet which seldom attains a height of three inches, common about Caldera, often exhibits from thirty to forty pods full of seeds upon a single plant. When one looks down upon it, he can see only a mass of yellow flowers and fruit pods. I might mention many other plants in which the same peculiarity is noticeable.

One other apparent adaptation deserves mention. It is said that a majority of the desert plants are shrubs, or at least, are suffruticose, and this accords with my own observation. I found that such growths are in the habit of shedding their leaves in the summer instead of winter, thus reversing the ordinary process of nature. By this means they reduce their vital expenditure to a minimum at a season when they need to husband their utmost strength in order to resist long and continued dryness. This leaves them free to exert their full powers at a period when they are most likely to imbibe the revivifying moisture. Aided in this by their thick, long and knotty roots and close, non-evaporating bark, these shrubs, which seem to be nothing but dead stocks in the summer, can withstand even several years of drought.

After premising this much concerning the locality and the flora in general, I will give some account of my own explorations in the Desert of Atacama. It was my good fortune to reach Caldera, the sea-port of Copiapo, in the month of September last, which is early spring time in that latitude. It also happened to be a year when this rare flora had sprung up, a thing which I understood from residents had not occurred for several years previously. A single rain had fallen in the month of June, and at the time of my visit the plants were in full bloom. Had the

visit been made two months later, I was assured that not a flower would have been in sight.

The sandy slopes around Caldera, especially where the soil was shaded by rocks, bore quite a number of species, the most common of which was a dusty–looking composite (*Encelia tomentosa*, Walp.) wlth pale yellow ligulate flowers, known popularly as *Corona de fraile*, so-called from the convex mass of disk flowers which remind one of the shaven crown of a priest's head. Several other species of Compositæ also occur in this vicinity, such as *Polyachyrus fuscus*, Walp., a tomentose plant with much dissected leaves and showy, oblong, close-flowered heads of purple florets, *Chuquiraga acicularis*, Don., a half shrubby, bushy, and very forbidding plant, which has crowded spine-tipped leaves, and small heads with yellow spinescent scales, and a *Closia*, the flowers and odor of which put one in mind of our Chamomile. Two delicate *Cuscutas* twined about small plants on the open sand, one of them with silk-like stems and white flowers, and the other with masses of purple blossoms. Both of these are popularly named "*Cabellos de angel*," Angel's hair. Lying close against the sides of rocks was a queer Asclepiadaceous shrub known as *Cynoctonum viride*, Phil. The stock which manages to survive the summer is short and stumpy, with a thick head like an old pollard willow, from which it sends out new green shoots whenever the winter rain falls. Out upon the open sand one frequently meets with *Frankenia aspera*, Ph., throwing its dark colored branches over the ground, *Scilla triflora*, Ph., a bulbous plant with erect stems and racemes of pretty white flowers, and *Oenothera Coquimbensis*, Spach., one of the species noticeable for commencing to flower when not much larger than a needle, and continuing the process till it is two feet in height. Here too I collected several species of *Eritrichium*, *Heliotropium*, *Osteocarpus*, *Tetragonia*, and other plants which there is no room to mention.

After rambling over the Caldera sands till my feet grew weary, I made a number of expeditions on horseback and by rail to more distant points. One of these was to a gorge among the hills seven or eight miles north of Caldera, known to the people as the "*Quebrada* (ravine) *de los leones*." I was informed that the name

owed its origin to the fact that in former years a number of pumas or Chileno lions had been killed in the ravine. Here also lovers of the chase had often come to hunt the guanaco, an animal somewhat smaller than the llama, but belonging to the same family. Neither lion nor guanaco, however, appeared to welcome me to his lair, a circumstance which I did not much regret. On the way to this mountain defile we rode along the sea-shore for several miles, and then struck inland over a wide track of loose, shifting sand into which our horses sank nearly half way to the knees, and which is continually blown about by the wind. Along this route I gathered a number of interesting plants. Among them was a *Calandrinia*, the common name of which is "*Pata de guanaco*," or guanaco's foot, so-called from the fancied resemblance of the shape of its leaves to the hoof of the guanaco. This elegant flower throws up a tall, branching stem, each branch bearing on long naked peduncles several large and brillant purple blossoms, a conspicuous object upon the desert. Another species, or perhaps only a variety of this, much smaller in size, grows near the sea-shore, having a bright yellow corolla. In clumps around which the sand is often heaped in ridges as if against a wall occurred an odd-looking, yellow-flowered shrub of the Apocyneæ, (*Skytanthus acutus*, Meyen), popularly named "*Cuerno de cabra*," or Goat's horn, from the singular habit which its long, pointed follicles have of twisting themselves into the shape of a pair of goat's horns. The resemblance is so exact, that every one calls them by that name at first sight. In similar situations is found an *Ephedra*, vulgarly "*Pingo-pingo*," the naked sharp-pronged stems of which seem just in place in such a region. We frequently rode through mounds of sand in which clumps of these two shrubs were completely buried.

Farther along the sand was firmer, but attended by a new danger to the horseman. A small lizard, of a livid color and some six or eight inches in length, the only animal that we encounted in our excursion makes its burrow in these inhospitable wastes. As the animal is quite gregarious in its habits, we often came upon spaces entirely honeycombed by scores of these little creatures. Riding incautiously upon such ground our horses would suddenly sink over the fetlock into these burrows

and stumble badly, running great risk of breaking a limb or throwing the riders over their heads. About such spots, however, some charming flowers were obtained. One of these was *Cruckshanksia Geisseana*, Ph., an elegant plant, covered with masses of showy yellow flowers, very fragrant, and remarkable for its involucral, long-stiped sepals. Another was a Bignoniaceous species, named *Argylia*, which has long, finely dissected radical leaves, and a scape ten or twelve inches high, having a large cluster of yellow trumpet-shaped flowers at the summit. Still another plant of much interest, growing in clumps, was an Umbellifer called *Eremocharis*, a tall almost naked stemmed undershrub, with long internodes and curious subbipinnatifid leaves, which emit the odor of apples when first plucked or bruised.

Along this route also grew some of the most peculiar Cacti that I had ever seen. The most noticeable of all belongs to a genus created by Philippi, and is, I believe, confined to this desert, named *Eulychnia breviflora*. It throws up from a cluster of roots numerous columnar stalks about as large in diameter as a man's arm, and armed with innumerable long, unequal, needle-like spines. The flower is on the summit of the stalk, not unlike a large cup in aspect, the lower part of which is covered with crinkly velvet hairs of a lavender hue, above which rises a single row of stiff white petals, including a host of delicate stamens. Another Cactus of the melon variety, not over eight inches high, and not unlike a pineapple in shape, has its spines twisted about the stem so that they resemble a bird's nest, inside of which the small red flowers hide like eggs.

When we reached the Quebrada, we found it to be a very rocky ravine running up the hillside between two eminences, along the slopes of which were heaped many boulders, as if carried down there by floods in former ages. Among the rocks trickled a small stream of water, which soon lost itself in the sand at the bottom of the ravine. As the day was quite warm, and I was heated and tired with my long ride, it sounded very pleasant to hear the gurgling of water, and as I have often done on such occasions in the White Mountains, I hastened to scoop up a drink in the hollow of my hand. My companion, a native Chileno, laughed at my motions, and with good reason, for I had

no sooner tasted the water than I spit it out with disgust. Who could drink brine?

All the pools and rivulets which occur in this region absorb more or less soda from the soil, which seems everywhere impregnated with this mineral. Luckily we carried with our lunch a bottle of the condensed water used in Caldera, or we should have been unable to quench our thirst. For this disappointment I was consoled by finding a number of beautiful flowering plants among the boulders that filled the ravine.

The most attractive of the plants were a very handsome species of *Alstræmeria*, which exhibited great lilac flowers, the petals streaked with blue veins and yellow blotches, and a tall *Centaurea* with white heads as gay looking as those of our Ox-eye daisy. A shrubby *Euphorbia*, five or six feet in height, with large white flowers, was abundant. This plant possesses a copious milky juice which pours from every wound made in its stem or leaves, and from this property is popularly called *Lechero* (milkman) and hence has been named by Philippi *E. lactiflua*. A pretty *Stachys* peeped from under the rocks whose shade it loves, and a broad-leaved, clammy *Nicotiana* and a *Solanum*, heavily laden with trusses of bright purple blossoms grew in more sunny spots. In this vicinity also flourishes a flower greatly coveted by the inhabitants of Caldera and called by them *Añuña* (*Habranthus añuña* Phil.). It springs from a bulb of the size of an onion and bears at the summit of a tall scape a cluster of yellow tubular blossoms. The most charming of all the plants collected in this quarter is a *Tropæolum* (*T. tricolor*, Lind.) a delicate vine which climbs upon shrubs in thick masses, profusely decorated with spurred corollas whose bright tints of orange, red and blue offer a standing invitation to all the humming birds that live in the vicinity.

A few days after returning from this excursion, I made another in the company of a friend to a craggy hill known as the *Morro*, some ten miles south of Caldera. Morro is a Spanish word denoting any object that is round and over-hanging, and is applied on the coast to high rounded promontories that project into the ocean. Our route to this promontory lay by the seaside, around a lovely bay and across a beach two or three miles in extent, which at low tide is as smooth and hard as a floor. So

beautiful was the day and so pleasant the ride by the sparkling blue waters of the Pacific, that even if there had been no botanical interest in the trip, I should have been more than satisfied. I returned, however, with my portfolio full of specimens of unique interest to the botanist. Before reaching the seashore or upon its borders, we passed through clumps of various species of *Nolana*, *Dolia*, *Phaca*, *Malesherbsia*, *Suaeda* and other plants which I will not attempt to describe. One species, however, deserves mention on account of its eminent fitness for a desert life, and that is an *Euphorbia*, named *E. Copiapina* by Philippi. It has a multitude of short stems which rise directly from a huge underground tuber, and lie in a circle upon the ground. The stems, leaves and flowers are lurid in hue as if burnt by a tropical sun, and the tuber, in aspect much like a big turnip, is full of milk. Other things might perish in that rainless climate, but such a tuber would be preserved for many years in the dry sand.

It was a very rugged and precipitous ascent that we had to climb when we struck the Morro. In places there was no path, the rocks were sharp, and the feet of our horses were continually sliding out from under them. In spite of such obstacles we finally reached the summit, and then hobbling our steeds we sat down to rest and to look around us. The view seaward was simply magnificent. The broad Pacific stretched out in its illimitable vastness towards the west, and the coast line of sandy plains, hillocks and rocky capes, indented by beautiful bays and estuaries, could be seen for miles until it faded into haze. Around us were jagged cliffs and deep precipices descending to the sea, but to my amazement a garden of beauty clothed the few patches of soil which lodged upon the summit and in the crevices of the rocks. Here were in this savage looking place at least a score of the finest species of flowers that I had yet discovered in the Atacama. *Nolana elegans*, Ph., fairly hid the backbone of the highest ridge with its bells of blue. *Achyrophorus*, a Composite with large golden heads, adorned the lower slopes. Fine specimens of the *Calandrinia* and *Alstroemeria* already collected at the Quebada de los leones added their bright hues to this mountain park. *Loasa Urmenetæ*, Ph., ran over other plants or trailed upon the ground. A handsome *Verbena* and a little *Gilia* en-

livened the scene. Several species of *Oxalis* occurred in sandy nooks, the most curious of which was *O. gigantea*, a thick watery stemmed shrub, as high as my head, the upper part of the stalk bearing a long spike of yellow flowers arranged irregularly around the rachis. Here, too, is found the only *Tillandsia* known in the region (*T. Geisseana*, Ph.), which is, strangely enough, a cactus epiphyte. Many other interesting species besides these were added to my collection in this attractive spot, not the least valuable being six or seven rare lichens. No doubt the remarkable fertility of this rugged headland is owing to the clouds which bathe its brows with moisture every night and morning in the months of August, September and October.

I have space only to give a brief sketch of an excursion that I subsequently made by rail from Caldera to Monte Amargo, twenty-five miles inland. The engineer, a pleasant and well-informed Englishman, invited me to take a seat with him in the engine where, he said, I could survey at my leisure the road and the arid pastures on which the mules were feeding. I saw numbers of mules, it is true, and in fact, as they have a special fondness for collecting in droves upon the railroad track, we came near running over some of them, a calamity which I learned was by no means infrequent, but what the creatures could find to feed upon passed my comprehension, unless it were a very disagreeable plant that seems smeared with varnish over all its parts, and known from that fact as *Alona vernicosa*. An animal which could browse on such herbage must be quite able to relish tar, varnish and such-like substances. This plant occurs all along the railway to Monte Amargo, and bears a very pretty bright blue flower. Possibly it was the flowers that attracted the mules, as it could not have been the taste.

Monte Amargo itself is only a railway station situated in a soda swamp. In the alkaline pools around it I gathered several species of Characeæ and Naiadaceæ, and in the bogs were growing a number of saline plants such as *Salicornia* (*S. Peruviana*, HBK.), *Triglochin* and several Cyperaceæ. Through this swamp runs the Copiapo River, or rather the modicum which is left of it after being used for irrigation in the valley above. It goes no further, being here absorbed by the desert sands. Upon its

banks I saw for the first time the Chañar tree (*Gourliea Chilensis*, Clos.), a sturdy close-branched, somewhat spiny shrub, which at the time of my visit was loaded with its bright yellow flowers. This shrub yields a toothsome fruit something like a plum, that is greatly relished by man and beast. It is often dried and carried as food upon journeys. I saw old stones lying under the trees which had been gnawed into by desert rats, which are extravagantly fond of the kernel. Here, too, was a gigantic *Juncus*, its numerous thorn-pointed stalks ten feet in height and spreading in all directions like chevaux de frise. It required considerable courage to thrust the hand among these spears in search of specimens.

Out upon the open sands I came upon a flora different from any previously collected. Here I began to meet with the *Adesmias* which are so numerous on the Pacific coast. Philippi enumerates 134 species that occur in Chile alone. More than a dozen of them have been discovered in the Atacama Desert. In this locality likewise flourishes *Eritrichium guaphaloides*, DC., which the inhabitants of the province of Copiapo call *Te del burro* or *Te del campo*, and of which they make an infusion and drink like Chinese tea. The *Acacia Cavenia* and *Lycium Chilense* stand like lonely sentinels upon the desert. Many other things rare and interesting greeted me in my wanderings over this region, but they cannot be noticed here. Of course the cosmopolitan plants, which go wherever man goes, were here to nod their familiar forms in my face. *Sonchus oleraceus*, *Solanum nigrum*, *Erigeron Canadense*, *Argemone Mexicana*, *Raphanus sativus*, *Erodium cicutarium*, *Gnaphalium purpureum*, and half a dozen other old friends were there to make me feel at home in this strange and distant land.

I was pretty well fagged out with my day's tramp when I heard the puffing of the train on its way back from Copiapo. My good friend, the engineer, was kind enough to respond to the waving of my handkerchief by stopping the cars and giving me a snug seat in the locomotive. Of my three rides none proved more enjoyable or botanically more profitable than the one on the iron horse to Monte Amargo.

Contributions to American Bryology.—II.

By Elizabeth G. Britton.

A Supplementary Enumeration of the Mosses Collected by Mr. John B. Leiberg in Idaho, with Descriptions of two new Species.

(Plate CXIV).

Continued from Vol. XVI., Page 112.

Andræa petrophila, Ehrh. Dry slate rocks, Traille River basin, May, 1889 (6).

Buxbaumia indusiata, Brid., previously listed as *B. aphylla*, L. Decaying logs, Traille River basin (159).

Georgia pellucida, (L.) Rab. (*Tetraphis pellucida*, Hedw). Decaying logs, Lake Pend d'Oreille, May, 1889 (155).

G. geniculata (Girgens). Braith. (*T. geniculata*, Girgens). Decaying logs in deep ravines, basin of Traille River, July, 1889 (194).

Oligotrichum Lyallii, (Mitt.) Lindb. Packsaddle Mountain, 8,500 feet, Lake Pend d'Oreille (73).

Polytrichum commune, L. Granite basins, near Rathdrum (229).

P. piliferum, Schreb. On rocks, Lake Pend d'Oreille, June, 1889 (110).

Var. *Hoppei*, Rab. (*P. Hoppei*, Hornsch.) Packsaddle Mountain, 6,000 ft. alt., Lake Pend d'Oreille, July, 1889 (163).

Fissidens limbatus, Sull. On granite ledges between high and low water line, Lake Pend d'Oreille, March, 1889, fertile (144).

F. osmundoides (Sw.), Hedw. With the above, sterile.

F. adiantoides (L.), Hedw. var. *immarginatus*, Lindb. Shores of Lake Pend d'Oreille, September, 1889, fertile (214).

Ditrichum flexicaule (Schleich.) Hpe. (*Leptotrichum flexicaule*, Hpe.) Exposed quartzite ledges, Traille River basin, September, 1889, sterile (232).

Dicranella secunda (Sw.), Lindb. (*D. subulata*, Schimp.) Shady canyons, Traille River basin, in woods, North Fork basin, May and June, 1889 (189).

Dicranella crispa (Ehrh.) Schimp. Upturned trees, broken soil, Traille River basin, September, 1889 (69).

Blindia acuta, (Huds.) Br. & Sch. On schistose boulders, deep ravines, Bareknob Range, Traille River basin, July, 1889 (207).

Dicranowcisia crispula, (Hedw.) Lindb. Granite ledges, Lake Pend d'Oreille, May, 1889 (193).

Dicranum schisti (Gunn.), Lindb. (*D. Blyttii*, Br. & Sch.) Fissures of quartzite rocks on mountains, 4,000–5,000 ft alt., near Rathdrum, April, 1889 (178).

D. Starkei, Web. & Mohr. Granite ledges, Lake Pend d'Oreille, 5,000-8,000 ft., July, 1889 (205).

Dichodontium flavescens (Dicks.) Lindb. (*D. pellucidum*, var. *serratum*, Schimp.) Wet rocks in streams, spray of waterfalls, Lake Pend d'Oreille, March and May, 1889 (62).

Phascum acaulon, L. var. *piliferum* (Schreb.) Braithw. Grassy open places, Lake Pend d'Oreille, Feb. 1889 (117).

Pottia Heimii, (Hedw.) Fuernr. Clark's Fork of the Columbia, Lake Pend d'Oreille, Sept., 1889 (212).

Mollia tortuosa (L.) Schrank. (*Barbula tortuosa*, Web. & Mohr.) Crevices of rocks near water line, Lake Pend d'Oreille, also shifting sand bars, mouth of Clark's Fork, March, 1890 (235).

Tortula subulata (L.) Hedw. (*Barbula subulata*, Beauv.) Upturned roots, Lakeside, March, 1890 (210).

T. mucronifolia, Schwægr. (*B. mucronifolia*, Br. & Sch.) Sandy soil, mouth of Clark's Fork, Lake Pend d'Oreille, Sept. 1889 (209).

Barbula rubella (Hoffm.), Mitt. (*Didymodon rubellus*, Br. & Sch.) Banks of silt, Clark's Fork, Sept. 11, 1889 (211). Ledges and loose boulders, low water mark, Lake Pend d'Oreille, Sept. 1889 (227).

Hymenostylium curvirostre (Ehrh.) Mitt. (*Gymnostomum curvirostrum*, Hedw.) Wet limestone ledges, 2200 ft. alt., Lake Pend d'Oreille, March, 1890 (46).

Leersia alpina (Sm.) Lindb. (*Encalypta commutata*, N. & H.) Loose soil on mountains, 3,000–5,000 ft. Lake Pend d'Oreille, May, 1889 (33).

L. extinctoria (L.) Leyss. var. *pilifera*, (Funck.), Braithw. (*Encalypta vulgaris*, Hedw. var. *pilifera*, Schimp.) In small bright yellow cushions on naked soil, 2,500 ft. alt., on Cape Horn Mountain, Lake Pend d'Oreille, April, 1890 (242).

L. SELWYNI (Aust.) (*Encalypta Selwyni*, Austin). On mag-

nesian limestone and dolomites in canyons, Lake Pend d'Oreille, May–July, 1889 (166).

Grimmia apocarpa, Hedw. Wet rocks, Traille River basin, March, 1889 (157).

Var. *rivularis*, (Brid.) W. & M., (*G. rivularis*, Brid.) Traille River, March, 1889 (151). On basaltic rocks, Spokane River, May, June, 1889 (226).

G. conferta, Funck. Exposed granite ledges, Lake Pend d'Oreille, April, 1890 (245).

Var. *obtusifolia*, Sch. in same locations (246).

Var. *pruinosa* (Wils.) Braithw. (*G. pruinosa*, Wils.) Very common on dry limestone ledges, Cape Horn Mountain, 3,000 ft. alt., April, 1890 (247).

Grimmia torquata, Hornsch. Since the description of the fruit was published, (BULLETIN, xvi. 107), Mr. Leiberg has collected much finer specimens showing the fugacious peristome, and annulus. The teeth are short and broken, with a median line; the annulus is composed of many rows of cells, falling in fragments with the lid. (See Rev. Bryol. xvi. 64).

GRIMMIA PHILIBERTIANA, n. sp., Plate CXIV. Rare on quartz croppings of metaliferous veins, 6,000 ft. alt., divide between Traille River and Independence Creek, Sept. 27, 1889 (219).

Dicœcious; plants pulvinate in small dark green cushions; stems 2-3 cm. high, naked and decumbent below, branching and spreading above; leaves erect-incumbent when dry, not secund, spreading when moist, 1½-2 mm. long; lanceolate, carinate, with recurved margins, and toothed hair-points 15 mm. long, but generally deformed and bearing granulose, globose propagula on the tips of the leaves or retuse and bifid along the midvein; cells above rounded, hexagonal, nearly 1 μ in diameter, faintly sinuous and oblong at base, discolored, with slight enlargement at the basal angles; vein heavy 1½ μ wide at base, rounded at back, sulcate above. Perichætium also deformed, leaves broader, inner short, triangular and hyaline at base. Pedicels one or two from the same perichætium; seta twisted, variously bent, 3-5 mm. long; capsule 1 mm. long, broadest at the mouth, smooth when dry, pale with a red rim; columella long, slender, excurrent; teeth recurved, red, undivided, with five or six short, broad segments below and four or five slender papillose internodes above; annulus of very delicate cells; lid with a beak nearly 1 mm. long, straight or oblique, calyptra mitrate just covering the beak.

Mistaken for *G. Hartmanni*, Schimp. (BULLETIN, xvi, 340, and Rev. Bryol. xvii, 16) which it so closely resembles that the figures given by Husnot (Musc. Gall. t. xxxix) and Braithw. (Brit. Mosses. t. xlviii.) would do for either. Specimens were sent to M. Philibert, whose excellent description in the Revue Bryologique xiv. p. 50, seemed to me to answer perfectly to my specimens. He kindly sent me fruiting specimens from Corsica, which differ in the plants being much larger, with stems 6-7 cm. long, leaves much twisted and secund, narrower and longer, much less deformed by propagula; with cells much more sinuous and the teeth of the peristone less papillose and *bifid?* so drawn by Mr. Anderson to whom I sent the only perfect peristome of *G. Hartmanni*. But it is evident that this is not always true, for Philibert says of these same Corsican specimens "Dents lanceoleés-lineares, obtuses, entieres, d'un rouge orangé assez pâle; tres-lisses dans les deux tiers inferieurs; le tiers superieur, légèrement papilleux." Ours are not *obtuse*, bright red not orange-colored, and conspicuously papillose. The difference between figs. 28 and 35 is also not so great in all specimens, these being extremes.

Dedicated to M. H. Philibert, Prof. honoraire de la Faculte des lettres, Aix, Bouches-du-Rhone, France, who has kindly furnished me with fruiting specimens, and who says: "Je croix que cette forme dois constituer une espèce nouvelle."

G. Muehlenbeckii, Schimp. Granite ledges, Lake Pend d'Oreille, May, 1889 (3 pp.).

G. montana, Br. & Sch. var. *brachyodon* (Aust.) L. &. J. Granite ledges, Lake Pend d'Oreille, May, 1889 (53 pp.). Quartzite ledges, 5,000 ft. alt. Rathdrum, April, 1889 (188).

G. alpestris, Schleich. Granite ledges, Chilco range, 6,500 ft. alt., May, 1889 (40). On erratic blocks of granite, Lakeside, Lake Pend d'Oreille, March, 1890.

G. ovata, W. & M. (*G. commutata*, Huebn.). Ledges near water line, Lake Pend d'Oreille, April, 1889, Feb., 1890, (13 & 17).

G. calyptrata, Hooker. On dry granite boulders, 2,500 ft. alt. Lake Pend d'Oreille, March, 1890 (55).

G. campestris, Burchell (*G. leucophæa*, Grev.). Dry exposed

ledges, in closely adhering whitish tufts, Spokane River at Post Falls, above high water mark, April, 1890 (239).

G. Nevii, C. M. (*Racomitrium Nevii*, S. Watson). Wet ledges, Lake Pend d'Oreille, May, 1889 (19 pp).

G. canescens (Timm.) C. M. (*R. canescens*, Brid.). Rocky places, Lake Pend d'Oreille, Sept., 1889, fertile (149). On the ground on gravel bars in Traille River, submerged at high water, very abundant, sterile, July, 1890.

G. hypnoides (L.) Lindb. (*R. lanuginosum*, Brid.). Granite ledges, Lake Pend d'Oreille, sterile, July, 1889 (47).

G. ramulosa, Lindb. (*R. microcarpon*, Brid.). Granite ledges, Lake Pend d'Oreille, May, 1889 (186).

Pohlia pulchella, (*Webera pulchella*, Schimp.). Lime springs, Gold Creek, Lake Pend d'Oreille, April, 1890 (237).

BRYUM LUCIDUM, n. sp. (BULLETIN, xvi, 340).

Plants slender, scattered not gregarious, light glossy green; stems from radiculose stolons, 2-3 cm. high, simple and naked below; leaves rosulate, not twisted when dry, 3-5 mm. long, broadly elliptical above, with parallel margins at base, blunt with the vein disappearing below the apex or with a serrate-cuspidate point; vein heavy and frequently red at base, tapering and vanishing below the apex; margins of long prosenchymatous cells forming small appressed teeth, entire below. Cells of the lamina parenchymatous, elongated hexagonal. $1 \times 2\mu$.

Dicœcious. Pedicels single, 3-4 cm. long, stramineous, lustrous and sulcate; capsule reflexed, horizontal or erect, 5-7 mm. long, constricted below the mouth, neck short; teeth with a very faint median line (omitted in fig. 5) segments of endostome split, cilia 3-4 not appendiculate, faintly papillose, very irregular, variously divided and elongated; lid apiculate, calyptra cucullate, annulus not seen.

This species belongs to the section Rhodobryum nearest to *B. proliferum* (L). Sibth. (*B. roseum*, Schreb.), from which it differs in its habit, size, leaves not twisted when dry, pedicels single, marginal cells of leaves longer and in the irregular, not appendiculate cilia.

Collected on mountain slopes near Rathdrum in May, 1889 (224) and on the ground among pine needles, slopes of the Traille River; alt. 4,500 ft., Oct. 18, 1889, fruiting. Also sent to me in exchange for the above by Prof. D. C. Eaton, collected by R. S.

Williams at Tiger Butte, Montana, June 19, 1887 (60); also by John Macoun, who found it on the summit of the Gold Range, B. C., alt. 6,000 ft. under *Abies subalpina*, Aug. 8, 1889, sterile, named by N. C. Kindberg *Mnium simplex*, ms.; quite recently received from W. N. Suksdorf, collected in Falcon Valley, Washington, May 8, 1890 (7) sterile.

Meesia triquetra (L.) Lindb. (*M. tristicha*, Funck). Along open places by every mountain stream, July, 1890 (255).

Bartramia Œderiana (Gunn.) Sw. Precipices and ledges of the Chilco Range, May, 1889. Wet rocks in cold ravines, Traille River basin, April, 1889 (118).

B. ithyphylla, Brid. Fissures of rocks, Packsaddle Mt., 8,500 ft., July, 1889 (50).

B. Menziesii, Turn. Granite ledges, Lake Pend d'Oreille, April and May, 1889 (122).

Leskea polycarpa; Ehrh. Granite ledges, Lake Pend d'Oreille (240).

Pseudoleskea atrovirens (Dicks.). Br. & Sch. Outcroppings of quartz veins, Traille River, divide, Sept., 1889 (220).

Amblystegium Sprucei, Bruch. Crevices of rocks, Lake Pend d'Oreille, May, 1889 (216).

A. cordifolium (Hedw.) DeNot. Edges of beaver ponds, Lake Pend d'Oreille, Oct., 1889 (222).

Limnobium dilatatum, Wils. (*L. molle*, Br. & Sch.) Sterile, on ledges at low water line, Lake Pend d'Oreille, Sept. 1889 (265).

L. palustre, Huds. Mountain streams, Lake Pend d'Oreille, Sept., 1889, sterile (215).

L. arcticum, Sommerf. Waterfalls, Traille River basin, Sept., 1889, sterile. (16pp). In cold mountain streams, Sept., 1890, sterile (266).

L. obtusifolium (Hook.), L. & J. Submerged rocks, swift mountain streams, fertile (16). In 10-25 feet of water, Lake Pend d'Oreille, sterile (79). According to Lesquereux and James. Manual, p. 400, this species is rare in fruit, having been found but once by E. Hall and then without the operculum, but specimens in the James herbarium labelled *Rhynchostegium rusciforme*, Br. & S., collected by Bolander in rivulets, Cali-

fornia are fertile and operculate. Mr. Leiberg's specimens show a short, oblique, operculum and great diversity in the basal cells of the leaf.

Isothecium stoloniferum, Hook. Granite ledges, in shady places, Lake Pend d'Oreille, May, 1889 (58 and 174).

Pterigynandrum filiforme, Hedw. On granite ledges, Lake Pend d'Oreille (23).

Heterocladium dimorphum, (Brid.) Br. & Sch. Mineral Point, Lake Pend d'Oreille, sterile on dry slate ledges (175). On quartzite ledges 5,000 ft. alt., divide between Traille River and Independence Creek, Sept., 1890.

Heterocladium aberrans, Ren. & Card. With *H. loreum*, fertile; shady woods on the ground, Traille River basin, 1888 (84pp). Granite ledges Lake Pend d'Oreille with *Isothecium*, May, 1889 (174pp). On rocks, trees and on the ground, along streams, April, 1890 (138).

H. heteropterum, Sch. On quartz croppings of metalliferous veins, Traille River basin, June, 1890; also in large mats on ledges, near water line, along Traille River, July 19, 1890 (254).

Hylocomium parietinum (L.), Lindb. (*Hypnum Schreberi*, Willd). Granite ledges, Lake Pend d'Oreille (168).

H. squarrosum, L. Grassy places, Traille River, Sept., 1889 (71).

Tripterocladium leucocladulum, Muell. (*Platygyrium rupestre*, Kindb. BULLETIN xvii. p. 276.) Compared with the types kindly sent me by Chas. Mohr of Mobile, Alabama, and with Macun's Canadian Mosses No. 469. Crevices of granite ledges, shores of Lake Pend d'Oreille, sterile, April, 1890. Hanging in dense masses from escarpments of dolomite, in shady cañons, North Gold Creek, Lake Pend d'Oreille, fertile. May, 1890 (241).

Pterigophyllum lucens, Brid. Traille River basin, July, 1890 (249).

Climacium dendroides, W. & M. Traille River basin, Feb. 1889 (176).

Antitrichia curtipendula, Brid. var. *gigantea*, Lesq. On trees, Traille River Basin, June, 1889 (177).

Alsia abietina, Sull. pl. m. In one location only under overhanging ledges. Lake Pend d'Oreille, March, 1889 (156).

Description of Plate CXIV.

Fig. 1.—BRYUM LUCIDUM, E. G. BRITTON, about natural size.

Fig. 2.—An enlarged capsule.

Fig. 3.—The peristome more highly magnified.

Fig. 4.—A very young capsule, with calyptra considerably magnified.

Fig. 5.—One tooth of the outer peristome considerably magnified.

Fig. 6.—Portion of the inner peristome, showing three of the cilia; one of them branched.

Fig. 7.—A leaf somewhat enlarged.

Fig. 8.—Tip of leaf highly magnified.

Fig. 9.—A portion highly magnified, showing basal cells and margin.

Fig. 10.—A portion highly magnified, showing lateral marginal cells and their contact with the inner cells taken about one-third below the apex.

Fig. 11.—*Bryum proliferum* (L.) Sibth., about natural size.

Fig. 12.—An enlarged capsule.

Fig. 13.—A fragment of the outer peristome.

Fig. 14.—A fragment from inner peristome, showing the two appendiculate cilia and open carinate segments.

Fig. 15.—Leaf somewhat enlarged.

Fig. 16—Tip of leaf highly magnified.

Fig. 17.—Fragment of margin of leaf two-thirds of the way up, showing contact of marginal with inner cells, highly magnified.

Fig. 18.—GRIMMIA PHILIBERTIANA, E. G. BRITTON, about natural size.

Fig. 19.—An old wrinkled capsule considerably magnified.

Fig. 20.—Two ripe plump capsules; one with straight and other with oblique beak, considerably magnified.

Fig. 21.—The peristome closed, considerably magnified.

Fig. 22.—The peristome open, considerably magnified.

Fig. 23.—Teeth of the peristome more highly magnified.

Fig. 24 —The simple tip of a tooth highly magnified.

Fig. 25.—A leaf somewhat magnified, showing peculiar margin which appears to be double, or in some specimens double near the apex and becoming free to revolute towards the base.

Fig. 26.—Tip of leaf in normal condition highly magnified.

Fig. 27.—Abnormal tip, bearing propagula on the distorted and abnormally situated teeth.

Fig. 28.—Highly magnified cells from near base of leaf.

Fig. 29.—Capsule, old and wrinkled, of *G. Hartmanni*, Schimp., from Corsica. Collected by H. Philibert, July 18th, 1870.

Fig. 30.—Capsule of same moistened, showing peristome closed, somewhat magnified.

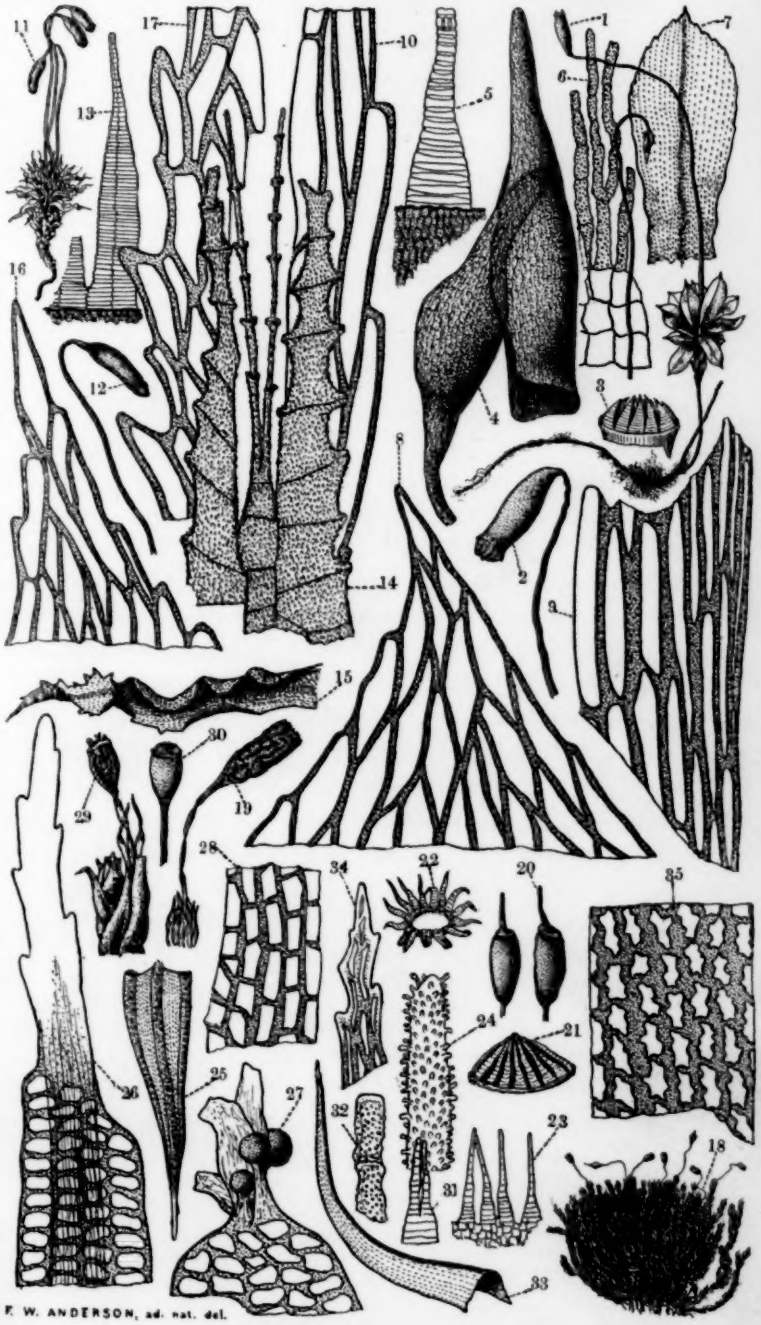
Fig. 31.—Tooth from peristome of same, showing the *bifid tip!* considerably magnified.

Fig. 32.—The end of one-half of a bifid tip highly magnified.

Fig. 33.—A leaf somewhat enlarged.

Fig. 34.—The tip of a leaf highly magnified.

Fig. 35.—A fragment showing cells near the base of leaf.



E. G. Britton. BRYUM LUCIDUM and GRIMMIA PHILIBERTIANA, n. sp.

Zizania as Found by the Explorers of the Northwest.

By E. J. Hill.

That the wild rice has long been considered a characteristic plant of this region is easily shown by an examination of the writings of the explorers of this country, from those of the French to the latest of Schoolcraft. Those of the French are not at hand, but abundant citations could be made from those of the English and Americans, and few must suffice. Captain Jonathan Carver, (1765–68), speaks of its "great abundance" in the valley of the St. Pierre, (since 1852 the Minnesota) up which he must have gone about 200 miles. Alexander Mackenzie (1789-'93), mentions its "abundance" along the "Grande Portage," the chain of lakes and rivers from Lake Superior to the Lake of the Woods, and the use of it by the Algonquins. He makes the following statement regarding its northward range: "To the north of fifty degrees it is hardly known, or at least does not come to maturity."* Major Zebulon Pike, (1805, 1806), tells of its great plenty about the sources of the Mississippi, and of its sale by the Indians to the fur-traders for their subsistance. In the account of the Lake of the Woods in Major Long's expedition, Prof. Keating, who accompanied the party as geologist and historiographer, writes: "We found in great abundance the plant which bears the wild rice; it was quite ripe at that season.† The Indians collect the grain in great plenty, considering it as one of their best articles of food, and that upon which they can place the greatest reliance. We have been led to make some inquiry as to the extent of the region in which the wild rice grows, and we find it to be very great. Mackenzie says that wild rice is hardly seen, or does not come to maturity, north of the fiftieth degree of latitude, and we believe that it does not grow west of the Mississippi below the mouth of the Missouri, or on any part of this river. Its western extremities are probably about the sources of the St. Peter; it ranges in latitude from the thirty-first to the fiftieth degree, and in longitude from the Atlantic to the ninety-seventh degree."‡

*Mackenzie's Voyage, London, 1801, p. LXI.

†End of August.

‡L. c. Vol. 2, p. 106.

Schoolcraft was connected with three expeditions to the Mississippi, either as principal or assistant. The volumes he wrote concerning them abound in references to the natural history of the section he traversed, for he was a careful observer. Among these the wild rice finds frequent mention, though least in the account of the journey to the central Mississippi, since the plant did not particularly characterize that region. In the expedition of 1832, when he traced the river to Itasca Lake, and subsequently ascended the St. Croix, he speaks there of the latter river. "Both branches, together with its lower tributaries, and their numerous lakes, yield the northern rice plant. The abundance of the plant has led to the local term of the Folle Avoine country, a name by which it is particularly known in the transactions of the fur-trade."* In the account of the first expedition, when describing the physical characteristics of the Mississippi, and of its origin in a region of lakes, he speaks as follows of its upper waters: "It pursues its course to the falls of Peckagama, a distance of two hundred miles through a low prairie, covered with wild rice, rushes, sword-grass and other aquatic plants."† And in giving what he regards as the most characteristic plant, he continues: "The wild rice (*Zizania aquatica*), is not found on the waters of the Mississippi south of the forty-first degree of north latitude, nor the Indian reed or cane‡ north of the thirty-eighth. These two productions characterize the extremities of the river."§ The range is not strictly correct as to area; it is as to abundance and use of the plant by the Indians. One extract from the remaining volume will show how he looked upon the rice of the lower lakes as compared with that of the Fox River, Wis., which belongs to Lake Michigan, and that of the Upper Mississippi. He came upon it first at the mouth of the Maumee, where now is the city of Toledo, and makes this comparison:

*Narrative of an expedition through the Upper Mississippi to Itaska Lake, embracing an exploratory trip through the St. Croix and Borntwood or Broulé Rivers. New York, 1834, p. 140.

†Narrative Journal of Travels through the Northwestern Regions of the United States, extending from Detroit through the Great Chain of American Lakes to the sources of the Mississippi River, etc, in the year 1820. Albany, 1821, p. 255.

‡*Arundinaria macrosperma* and var.

§L. c. p. 259.

"Its banks are flat and thickly wooded and conspicuously bordered by aquatic plants. Among them the common bulrush and the wild oat or rice may be noted. The latter plant, to which the natives apply the soft name of monomin*, presents a beautiful aspect when in flower, but it does not attain that luxuriant growth which we have observed near the sources of the Mississippi and along the shores of the Fox River, so abundant in this native grain. * * In ordinary seasons the quantity which is gathered in certain parts of Michigan† and Hudson's Bay Territories is truly surprising. We are informed by Mr. Harman that at a single post on Rainy Lake, the Northwest (now Hudson's Bay) Company purchased from the natives an annual supply of twelve or fifteen hundred bushels, and it constitutes a principal article of food at the trading posts in that quarter."‡ And I may add that Carver alone did not find the plant of the lower lakes equal to that farther west. He devotes the last chapter of his volume to the plants which attracted his attention, especially those of use to the Indians, and says of the wild rice: "I found great quantities of it in the watered lands near Detroit, between Lake Huron and Lake Erie, but on enquiry I learned that it never arrived nearer to maturity than just to blossom, after which it appeared blighted and died away."§ This he ascribed to climatic conditions that the present experience of fruit growing and agriculture in Michigan would hardly warrant. Whether the condition was temporary or still holds would be well to verify, since it seems to have been well-marked at the time.

From these extracts and observations it appears that the wild rice, though plentiful and known to have been gathered by the Indians in the regions between Lake Huron and Lake Michigan, as well as elsewhere, had its principal field in the country west of Lake Michigan, in Wisconsin, Minnesota and a part of

*Chippeuay.

†Michigan Territory then embraced the region of the Upper Mississippi, or at least was governed from Detroit after 1818.

‡Travels in the Central Portions of the Mississippi Valley. Performed under the sanction of Government, in the year 1821, by Henry R, Schoolcraft. New York, 1825, pp. 20, 21.

§Travels through the interior parts of North America in the year 1766, 1767 and 1768, by J. Carver, Esq., 3d Ed., London, 1781, p. 525.

the Hudson Bay Territory. Of this, but a comparatively small part was tributary to Lake Superior and Lake Michigan, the Fox River Valley being the chief one. And nearly all the region of Indiana and Illinois, though much less abundant in the production, must be added. I have been thus particular regarding this plant, not alone to correct any error that may have arisen concerning it, but to bring together some facts concerning a state of things that has largely passed away, or will soon be of the past, like the Indians who once were in power here. Those still gather the grain who live in the region of the Upper Mississippi and the Red River, and perhaps some scattered communities in Wisconsin. I saw some of it in 1889 at Vermilion Lake, where a few of them still reside; soon, however, it was said, to move elsewhere.

A New Locality for Lychnis Floscuculi, L.

The last edition of the Manual gives the range of this plant as New England and New York. It is but sparingly established in New York, however. Dr. Watson informs me that it was collected at Old Chatham, N. Y., in 1888, by C. E. Faxon. This is the only place in the state at which I can learn of its having been found until last season; it was collected by my brother at Irvington on the Hudson. The station is at the Irving grounds, just north of Irvington. Quite a number of specimens were found growing in the edge of the lawn near the entrance to the grounds. The frequent mowing of the lawn had kept them from becoming very numerous; but farther north and directly west of the house, there is a strip of waste land bordering the Irving grounds on one side and the Hudson River Railroad on the other. Here the plant was found growing quite abundantly. How it became established here is uncertain. It may possibly have been cultivated on the grounds at some former time, or its proximity to the railroad may account for it.

However this may be, it seems to have thoroughly established itself at this place. CORNELIUS L. SHEAR.

Botanical Note.

The Botanical Society of Western Pennsylvania have issued their Calendar for 1890-91. This little pamphlet contains a brief

history of the organization, its proposed dates of meeting, list of members, books in the library, etc. The officers for the present year, beginning last October, are President, Prof. J. W. Caldwell; Vice-President, Rev. H. R. Johnson; Corresponding Secretary, Prof. J. G. Ogden; Recording Secretary, Miss W. L. Matthews; Treasurer, C. C. Mellor; Curator, John A. Shafer.

Reviews of Foreign Literature.

A New Theory of the Process of Growth of the Plant Cell.— In the "Berichte der Deutschen Bot. Gesellschaft" for August, 1890, pp. 196, is an article by Dr. Julius Wiesner entitled, "An Attempt to Explain the Growth of the Plant Cell." The writer states that most botanists assume that the growth of the cell and its parts takes place by means of intussusception; others discard this theory entirely and claim that the method is that of apposition; still another class try to harmonize known facts by a combination of the two theories, namely, that both methods of growth occur. Then follows a brief statement of an explanation which is entirely independent of the much-vexed question of intussusception or apposition.

This theory, if substantiated, would lead to an over-throw of several other long cherished opinions respecting not only the manner of growth of the cell but the nature of the substance composing it, and is altogether of such a revolutionary character as to warrant an almost literal translation of the article referred to.

In his explanation he first shows the analogy between growth in general and that of the smallest part of the organism; for example, the growth of an organ, leaf or stem, takes place by an increase in volume coming from the extension of a whole or part of its cells. There may be unequal development, one part growing faster than the other, but the whole organ gets its shape, size, etc., from the growth of the cells composing it. Now the cell growth is similar to this, in so far that it is accomplished by the parts composing it. Without any apparent shoving or displacement, it grows in surface, in length, and in thickness, the growth always preserving the intercalary nature of all new formation. This very idea of intercalary growth led to the notion of

intussusception. This analogy between the processes of growth in an organ and that of the cells composing it, is not merely external. All scientists agree that no living substance can originate from a dead one. That is, inside the organism all living substance must come from living. This is the first assumption or premise on which is founded the new theory.

In order to avoid misconception here, he explains, that in the process of assimilation, in its widest sense, dead substance becomes a part of living, but that this can happen only in the presence, and by the aid of living matter, so in this sense there is no objection to the hypothesis as above stated.

The second assumption is, that no other method of new formation occurs in an organism except that of division. The cell originates from the division of a cell; the same is true of the nucleus, also of the chlorophyll-grain or that from which it springs, etc., etc. The process of division is found to be so intimately connected with all living things as to lead to the conclusion that it also plays a part in processes so obscure as to be hidden from our observation. This hypothesis is closely connected with the first. Admitting these two premises we must necessarily admit that protoplasm cannot regenerate itself without a process of inner division. That is, when a meristem cell divides and its parts extend themselves, the substance being increased, this new formation is the result of the inner division of the protoplasm. Therefore the living substance of the plant, and to this is reckoned not only the cytoplasm, nucleus and similar structures, but also the cell-wall, must consist of little organized individuals having the power to divide themselves. They must also have the power to grow, else they would cease to be organized; having the power to grow implies the power to assimilate. Therefore the conclusion, "Living substance consists of small organized individuals, having the power to divide, to grow, and to assimilate."

These smallest portions of the organism he names *Plasomen*, and says in reference to their union with one another, it may be of various kinds, but probably in most cases they are so united that each is in contact with water. Now if the cell and its living parts are composed of these plasomes, as a leaf is composed of cells, then the growth of the cell must result from the growth of

its plasomes, just as the leaf or other multicellular organ grows by the volume increase of its cells.

The question how these plasomes grow, after division takes place, is answered as follows: As the masses they compose possess a large quantity of water, they are easily moved upon each other, therefore the process of intussusception is not necessary to cause their increase in volume. This increase, in case of a plasome which has just divided, may be explained in a purely physical manner. By diffusion and absorption, water holding solid substance in solution enters these little bodies and is assimilated; in this way the solid matter of the product of assimilation fixes the volume of the plasome.

The only question unanswered by this hypothesis is, "How does the dead substance, which posesses a certain molecular structure, become a part of the living unit in such a way that after a certain time it no longer posesses this structure but is an integral part of the living unit, and division again occurs?"

Just as the molecule is the final form element of lifeless matter, so is the plasome the final form element of living organism. All the processes of division occurring in the cell depend on this ability of the plasome to divide; for example, if a chlorophyll grain divide, it is not by the simple process of a part of the plasomes separating from the remaining portion, but by a sing lelayer of these units dividing.

But the growth of the protoplasm must be distinguished from that of the plasome; the latter, by growth, simply makes good its former volume, while the protoplasm grows by the increase in number of its plasomes.

This theory of the manner of growth does not exclude the notion of increase in volume by the stretching caused by pressure.

The foregoing, while not a literal translation, gives nearly the whole of this paper of Prof. Wiesner, which he says contains in brief the conclusions reached by several years of study, and while it may be regarded as an effort to consider the question of cell-growth from a new stand point, it is more especially an effort to make clear those points about which converge the new discoveries about the life and development of the cell, and particularly the meaning of the processes of division.

In the foregoing article only the questions relating to the manner of cell growth are considered, and of these the principal ones are so familiar as to need no explanation in regard to the application of the theory here set forth. In a foot-note the author says: "The act of conjugation does not refute the principle that all new formation takes place by division, as before this can occur, new cells are formed by division."

This naturally suggests another application than that made by Prof. Wiesner. The reviewer may perhaps be pardoned for briefly stating this possible application, as it seems to follow as a natural consequence of the new theory.

If this new method of growth be applied to that of reproduction, a reason is found for various facts not hitherto explained. Admitting that the process of growth consists of a division of the plasome and a subsequent increase in size by the assimilation of lifeless matter, may not the process of reproduction resemble this, except that the two halves of the divided plasome unite with the halves of other units? Thus in the case of conjugation, fusion of the two masses would mean, not simply a mingling of the micellae of the protoplasm of different cells according to the present theory, but first, a division of the plasomes of both masses, then a reunion, such that the halves of the protoplasm of one cell would unite with those of the protoplasm of the other cell. This represents the highest form, or that found in the highest plants. Next below this may be assumed the process known as rejuvenescence, a cell throws off its wall, the protoplasmic plasomes divide, then reunite, each half with that of another unit, a new wall is formed and the life processes of the original cell are repeated.

Following this in the downward scale comes the process known as asexual spore production. The plasomes of a part of the protoplasm of a cell divide, reunite as in the latter case, and thus become endowed with a new energy and have the power to germinate into a new plant. Below this comes the form of reproduction which is nearest to growth and in many cases difficult to distinguish from it, viz.: vegetative reproduction, division of masses without the union of divided plasomes with each other.

E. L. G.

Second Systematic Census of Australian Plants, with Chronologic, Literary and Geographic Annotations. By Baron Ferdinand von Mueller. (Part I. Vasculares, 4to, pp. 244. Melbourne, 1889).

This is a systematic enumeration of all species of flowering plants and Pteridophyta, known at the present time to inhabit Australia. The sequence of orders is somewhat different from those used by other recent authors; Baron Mueller dividing the Dicotyledonæ into (1) Choripetaleæ Hypogynæ, (2) Choripetaleæ Perigynæ, (3) Synpetaleæ Perigynæ, (4) Synpetaleæ Hypogynæ, (5)Apetaleæ Gymnospermæ. This grouping does away entirely with the artificial class Apetalæ. The Monocotyledonæ are divided into (1) Eucalyceæ Perigynæ, (2) Eucalyceæ Hypogynæ, (3) Acalyceæ Hypogynæ. The total number of species listed is 8839. N. L. B.

Recent Research among Fossil Plants. M. de Saporta. Rev. gen. de Bot. II, 1890.

In a recent number of Nature, (Sept. 25th, 1890), J. Starkie Gardner gives a review of the above which reads as follows;— It appears that mosses were almost certainly represented in the Palæozoics, a species allied to *Polytrichum* having been discovered at Commentry in France. Rarely as the fructification of ferns is preserved in the coal-measures, twenty species are now investigated, confirming the view that the Palæozoic species differed widely from the present, the vast order Polypodiaceæ and the Cyatheæ being unrepresented. The view that the *Calamarias* were in part Gymnosperms is all but universally abandoned, and the close affinity of the *Lepidodendrons* and *Sigillarias* and their cryptogamic nature everywhere admitted. Links in the chain of evolution between Cryptogams and Gymnosperms still elude our search, and the earliest vegetation of which we have any complete knowledge already presents well-developed Gymnosperms in the shape of the deciduous *Cordaites*, a few *Cycads* and obscure *Taxads* allied to *Ginkgo*.

Index to Recent Literature Relating to American Botany.

Abies concolor. (Gard. Chron. viii. 748, figs. 147-151).

Achyronychia—A New. T. S. Brandegee. (Zoe, i. 230, 231). *A. Rixfordii*, from Inyo Co., Cal.

Actæa—Remarks on the Genus. Edward L. Greene. (Pittonia, ii. 107-109).

Professor Greene maintains that we have three species of Baneberry in North America, all distinct from the Old World *A. spicata.* They are (1) *A. alba*, Mill, Gard. Dict. Ed. 8 (1768) which name has commonly been attributed to Bigelow. (2) *A. rubra*, Willd, and (3) *A. viridiflora*, a new species from the pine and spruce woods of the San Francisco Mountains, Arizona, first collected by Dr. Rusby and more recently by Prof. Greene.

N. L. B.

Agave Americana. (Garden, xxxix. 12, illustrated).

Basket-work of the North American Indians—I. V. Havard. (Garden & Forest, iii. 619, 620).

Basket making is one of the most extensive of the Indian handicrafts and it is natural that they should employ to the utmost such material as happens to be available. Taking the whole of North America as a range, the variety of material is necessarily considerable and in this first contribution to the subject the author mentions specifically six grasses, seven willows, three poplars, the rootlets of *Alnus rhombifolia*, *Rhus aromatica*, var, *triloba*, *Apocynum cannabinum*, bark of *Ulmus Americana*, shoots of *Cornus sericea* and *Vitis Californica.*

Biologiske Optegnelser om Groenlandske Planter. Eug. Warming. (Bot. Tidsskrift, xvii. 202-227, illustrated).

This is an account of detailed biological observations on Greenland plants, the present installment relating to the Scrophulariaceæ and especially to species of *Veronica*, *Pedicularis*, *Rhinanthus* and *Bartsia.*

Cañaigre (*Rumex hymenosepalus*). H. H. Rusby. (Drug. Bull. Nov., 1890, illustrated; reprinted).

Cattleya Walkeriana. St. Paul Hilaire. (Gartenflora, xxxviii. t. 1299).

Native of Brazil.

Cottonwood from Baja California. T. S. Brandegee. (Zoe, i. 274, 275).

Populus monticola described as new.

Cypripediums longifolium and Lowi. (Gard. Chron. viii. 728-730, figs. 143, 144).

Echinopsis cristata, Salm. H. Hildman. (Gartenflora, xxxviii. 286-288, one figure).

A Bolivian Cactus.

Ein Ausflug nach der Serra de Caparao (Staat Minas, Brazilien) nebst dem Versuche einer Vegetationsskizze der Dortigen Flora. W. Schwanke. (Engler's Bot. Jahrb. xii. Beiblatt nr. 28, 4-10).

Fungus Diseases of the Sweet Potato—Some. Byron D. Halsted. (Bull. No. 76, N. J. Agric. Exp. Station, Nov. 28, 1890, illustrated).

Black rot (*Ceratocystis fimbriata*); Soft rot (*Rhizopus nigricans*); Soil rot (*Acrocystis batatas*); Stem rot, White rot (*Phoma batatæ*); Sweet Potato Scurf (*Monilochætes infuscans*); Leaf blight *Phyllosticta bataticola*) and Leaf mould (*Cystopus Ipomœæpanduratæ*) are described and figured.

Index to Volumes vii-xvi Bulletin of the Torrey Botanical Club. Compiled by Elizabeth G. Britton. (Pamph. 8vo. pp. 31, New York, 1890).

List of the Plants of Ohio—Supplementary. Wm. R. Lazenby and W. C. Werner. (Pamph. 8vo. pp. 10, Ohio State University, Columbus, Ohio, Dec., 1890).

In this neatly printed and carefully edited pamphlet the authors state that it "is published for the purpose of showing what additions have been made to the last published catalogue," but they fail to say to what catalogue they refer. Among the various sources from which their information has been obtained, they fail to mention the "Catalogue of the Flowering Plants and Ferns of Ohio," by J. S. Newberry, published in 1860, and we infer that they have not seen it, inasmuch as about a dozen of their "additions" are mentioned in that work. Amongst these we note *Nymphæa odorata, Geum rivale, Myosotis laxa, Lophanthus scrophulariæfolius, Quercus prinoides, Smilax glauca* and

Carex cephalophora. The actual number of additions amongst the Phanerogams is 164 and of the Cryptogams 16, nine of which are Musci and seven Hepaticæ. The nomenclature adopted is that of the revised edition of Gray's Manual. In nearly every instance localities are given and also the name of the persons credited with the discovery. The authors promise a complete catalogue in the near future and invite all botanists to assist in the work, with which invitation we have endeavored to comply.

A. H.

Lobelia laxiflora, H. B. K. L. Wittmack and C. Græbener. (Gartenflora, t. 1301 and figures).

Loco-Weeds—Chemical Examination of Some. F. B. Power and J. Cambier. (Pharm. Rundsch. ix. 8-12, illustrated).

Astragalus mollissimus and *Crotalaria sagittalis* are discussed and the latter is figured.

Missouri Botanic Garden. Wm. Trelease. (Cloth, 8vo., pp. 165, illustrated, St. Louis, Mo., 1890).

In this volume we have a compendium, to date, of everything concerning the Missouri Botanic Garden. The preface tells us that it was prepared at the request of the Board of Trustees and the result must certainly be gratifying to them. A biographical sketch of Henry Shaw, with portrait, is the fitting prelude, after which follow copies of the legislative act which enabled Mr. Shaw te devise or convey his lands to trustees in accordance with his intentions; his will establishing the garden; the deed to Washington University, endowing the school of botany; an account of the inaugural exercises in Memorial Hall, Nov. 6, 1885; the first annual report of the Director for 1889; the report on the School of Botany, submitted June 3, 1890; the first annual flower sermon, by Rev. Daniel S. Tuttle, delivered in accordance with the provision of the will for the preaching of an annual sermon upon "The wisdom and goodness of God, as shown in the growth of flowers, fruit and other products of the vegetable kingdom," and the proceedings at the first annual banquet, May 26, 1890, under the provision of the will, which says: "I hereby bequeath one thousand dollars annually for a banquet to the trustees of the garden, and to the guests they may invite, literary

and scientific men and friends and patrons of the natural sciences; to be paid each year out of the funds devised for the support of the Garden." The illustrations include a map of the grounds, pictures of the buildings and characteristic scenes in parts of the garden. The plates, typography and general make-up leave nothing to be desired and we trust that this volume may be followed by many others of a similar character. A. H.

Monocotyledonen—Drei neue. R. A. Philippi. (Gartenflora, xxxviii. 369-371, t. 1302).

Latace is a proposed new genus of Liliaceæ, with a single species, *L. Volckmani* from the Andes of Santa Rosa, Chili; *Tillandsia Geissei*, from Caldera, and *Stemmatium narcissioides.*

Myrtaceæ ex India Occidentali a Dominis Eggers, Krug, Sintenis, Stahl aliisque collectæ. Hjalmar Kiaerskou. (Bot. Tidsskrift, xvii. 248-292; illustrated by seven plates and numerous wood-cuts).

An enumeration of the recently collected Myrtaceæ from the West Indies. New species are described in the following genera: *Calyptranthes, Marliera, Myrcia, Eugenia, Myrcianthes, Anomomis, Calyptropsidium, Myrtus* and *Marlieropsis*, a new genus with a single species, *M. Eggersii*, collected by Baron Eggers in Santo Domingo (No. 1,061). It is a very important paper, and illustrates how much is to be done in elucidating the West Indian flora. Altogether fifteen new species are characterized, mainly from Santo Domingo, Jamaica and the Bahamas.

Nomenclature and its Amenties. H. W. Harkness. (Zoe, i. 275, 276).

This is a memorandum on the recent argument between the editor of the BULLETIN and Mr. James Britten regarding the use of the generic name *Tissa* instead of *Buda* for the plants more commonly known under *Spergularia* or *Lepigonum.* The writer agrees with Dr. Britton, but is plaintive over the attitude taken by him, and complains of being driven. This we sincerely regret. A curious statement, illustrating want of research on the part of our critic, is that the name *Micrampeles*, Raf.—the old generic name for *Echinocystis* and *Megarrhiza*—has never yet been recognized by any one outside of the Torrey Club. We

were not aware that Mr. James Britten and Prof. E. L. Greene were active members of the club, yet if reference be made to the Journal of Botany and to Pittonia, ii. 127–129, such recognition may readily be found.

Notes concerning the Collection of Plants made by Xantus at Cape St. Lucas and Vicinity. T. S. Brandegee. (Zoe, i. 269–272).

Notes on North American Trees—XXI, XXII. C. S. Sargent. (Gard. and For. iv. 4; 15-6).

The author considers that the plant frequently referred to as *Myginda integrifolia*, Lam., differs so essentially from the other species of the genus as to deserve a distinct generic rank, and *Gyminda* is proposed—the name of a section of *Myginda* established by Grisebach for it. He also states that the specimen upon which Lamarck founded his species, now in the museum at Paris, proves to be *Rhamnus ferrea*, Vahl., so that *Myginda integrifolia* must be relegated to the position of a synonym for that plant, and the name *Gyminda Grisebachii* is proposed for its name in the future. *Reynosia latifolia*, Griseb., is the subject of a brief note in which the author says that if its reference to the *Rhamnus lævigatus* of Vahl, or *Ceanothus lævigatus* of DeCandolle, could be more satisfactorily established we should have to know it as *Reynosia lævigata*. The identity of these plants he, however, regards as doubtful, and hence retains *Grisebach's* name. In regard to *Condalia ferrea*, Griseb., he states that it has been referred to no less than six genera, in neither of which it seems to belong, and proposes to place it in the genus *Rhamnidium*, so that its name will become *R. ferreum.*

Notes on some Phanerogams of Central Minnesota. Conway MacMillan. (Bot. Gaz. xv., 331–334).

Brasenia peltata is noted from the northern part of the State, where "apparently it excludes from these waters the white water lily * * and tends to drive out the common pond lily." * * *Arenaria patula* and *Myriophyllum ambiguum* var. *limosum* were found in Cass County, and *Utricularia gibba* in Irving Chase Lake, all three reported as new to the State. *Liatris cylindracea*, as it occurs near Brainerd, diverges so remarkably from the type that a new variety is proposed and described, var. *solitaria.*

Oaks—Notes on Western. Edward L. Greene. (Pittonia, ii. 111–114).

Remarks on *Quercus Jacobi, Q. pungens, Q. turbinella* and *Q. agrifolia.*

Palmetto of the Southern States. W. P. Wilson. (Forest Leaves, iii. 53-54, one plate).

Description of *Sabal Palmetto* illustrated by a reproduction of one of Professor Wilson's capital photographs. There are allusions to other palms as well.

Peronosporeæ for 1890—*Notes upon.* Byron D. Halsted. (Bot. Gaz. xv. 320-324).

Potato Scab: a Bacterial Disease. H. L. Bolley. (Agric. Sci. iv. 277-287; Pl. iii. iv.)

Platystemon and Eschscholtzia—The Variations of. Katharine Brandegee. (Zoe, i. 278-282).

Ranunculus—Notes on. Edward L. Greene. Pittonia, ii. 109-110).

Notes on varieties of *R. subsagittatus* and *R. affinis; R. ellipticus* is described as new.

Reprint of Fraser's Catalogue. Edward L. Greene. (Pittonia, ii. 114-119).

Professor Greene has done botanists a valuable service in reprinting this old pamphlet, thus putting it within reach of everybody. The original is extremely rare. It was published in London in 1813, compiled by Thos. Nuttall. Its full title is "A Catalogue of New and Interesting Plants collected in Upper Louisiana and principally on the River Missourie, for sale at Messrs. Fraser's Nursery for curious American Plants, Sloane Square, King's Road, Chelsea, London." Professor Greene points out that *Yucca glauca* of this catalogue antedates *Y. angustifolia*, and *Dalea enneandra* antedates *D. laxiflora*, Pursh., and that *Sideranthus* is older than either *Chrysopsis* or *Aplopappus.* The copy is taken from the pamphlet preserved in the library of the Philadelphia Academy of Natural Sciences which belonged to Zaccheus Collins. N. L. B.

Root-tip—The. F. S. Sargent. (Pop. Sci. Monthly, xxxviii. 31-40, illustrated).

Simaruba Tulæ, Urban. Ign. Urban. (Gartenflora, xxxviii. t. 1298).

Native of Porto Rico.

Station Botanists at Champaign. Byron D. Halsted. (Bot. Gaz. xv. 334-339).

An account of the meeting of the Association of Agricultural Colleges and Experiment Stations.

Thismia Glaziovii, n. sp. V. A. Poulsen. (Overs. Kong. Danske Vidensk. Selskabs Forhand. 1890, 18-38, Plates II-IV).

Triuris major, sp. nov. et Bidrag til Triuidaceernes Naturhistorie. V. A. Poulsen. (Bot. Tidsskrift, xvii. 293-306; one plate).

Description of a new species of this interesting saprophytic genus, collected by Dr. Glaziou in Brazil, with a general discussion of the order.

Tubulina cylindrica and Allied Species of Myxomycetes—Notes on the Development of. Geo. A. Rex. (Bot. Gaz. xv. 317-320).

Uncinula spiralis, B & C.—Note on the Nomenclature of.—B. T. Galloway. (Bot. Gaz. xv. 339).

Variability in the number of Follicles in Caltha. T. D. A. Cockerell. (Nature, xlii. 519).

A tabulated series of observations on *Caltha leptosepala*, D.C. is given, in which the number of follicles varied from two to fifteen, the odd numbers being more common than the even and the total number of plants examined being seventy-five.

White Oak—The. (Gard. and For. iv. 1, 2, figs. 1 and 2).

This is another of the excellent popular descriptions of our common forest trees which have appeared from time to time in this publication. Typical examples of the species in each instance have been chosen, and the representations have been uniformly so good that they deserve more than a passing mention. The *Quercus alba* which illustrates this article is shown in its full summer foliage, and also as it appears in winter, with naked branches. We wish that more of our trees were figured in the same manner, so that the characteristic branching of each could be emphasized, often an important feature.